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IS 15805-1 (2008): Straw reaper-combine - Test Code, Part 1: Terminology [FAD 21: Farm Implements and Machinery]

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भारतीय मानक

तृण कटाई-कम्बाईन — परीक्षण संहिता

भाग 1 पारिभाषिक शब्दावली

Indian Standard

STRAW REAPER-COMBINE — TEST CODE

PART 1 TERMINOLOGY

ICS 65.060.50

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 2008

Price Group 3

Farm Implements and Machinery Sectional Committee, FAD 21

FOREWORD

This Indian Standard (Part 1) was adopted by the Bureau of Indian Standards, after the draft finalized by the Farm Implements and Machinery Sectional Committee had been approved by the Food and Agriculture Division Council.

Straw reaper-combine, commonly known as straw combine, is being increasingly used, for threshing of straw of various cereal crops grown in the country. As a result of its increasing use, the need for standardized tests for helping the testing authorities for the assessment of the performance of the straw reaper-combine on uniform and rationalized basis was felt and accordingly this standard has been published.

This Code has been published in two parts. This part covers definitions of the different terms most commonly used in relation to the straw reaper-combine to help in proper and uniform understanding to various terms. The other part covers the general guidelines and laboratory and field tests.

In the formulation of this standard, considerable assistance has been derived from Northern Region Farm Machinery Training and Testing Institute, Hissar; and Central Farm Machinery Training and Testing Institute, Budni.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding of numerical values (*revised*)'. The number of significant places retained in the rounded off value, should be the same as that of the specified value in this standard.

Indian Standard

STRAW REAPER-COMBINE — TEST CODE

PART 1 TERMINOLOGY

1 SCOPE

This standard (Part 1) covers the definitions for various terms most commonly used in relation to straw reaper-combine.

2 REFERENCE

The following standard contains provisions which, through reference in this text constitute provisions of this standard. At the time of publication, the edition indicated was valid. This standard is subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
8122 (Part 1) : 2000	Test code for combine harvester thre-sher: Part 1 Terminology (*first revision*)

3 STRAW REAPER-COMBINE AND ITS COMPONENTS

3.1 Baffle Plate — An element placed near the rear of beater to control the quantity of straw being supplied to cylinder for chopping.

3.2 Blower — A rotary device which produces a draught of air blast to uplift the chopped straw and deliver it through the outlet.

3.3 Blower Fan — A device to give air blast to uplift the chopped straw and to push it towards discharge outlet.

3.4 Cleaning Sieve — A set of sieves which separate grain and dust if any, present in the grain straw mass.

3.5 Concave — A concave shaped metal grating with knife blade partly surrounding the cylinder against which the cylinder chops the straw and through which chopped straw falls on to the sieve.

3.6 Concave Arc — A means of defining the angle of concave in degrees (*see* Fig. 1). This shall be measured from the front of first bar to the rear of last bar and in relation to the center of concave.

3.7 Concave Arc Length — The distance from the front of the first bar to the rear of last bar measured along the contours formed by the inner surfaces of the concave bar (*see* L in Fig. 1), expressed in mm.

3.8 Concave Area — The product of concave width to the concave arc length, expressed in mm^2.

3.9 Concave Width — The minimum distance between the two panels of the straw reaper in which concave is mounted (*see* W in Fig. 1), expressed in mm.

3.10 Cutter Bar — The assembly comprising finger bar, fingers, knife guards, wearing plate, outer shoe and main shoe, that is the non-reciprocating part of the cutting mechanism.

3.11 Cutter Bar Effective Width — The distance between the points at which the tips of the knife sections meet the last effective shearing edges of the guards/fingers or shoes at the extremities of the cutter bar, expressed in mm (*see* Fig. 2).

3.12 Cutter Bar Height — The height of the effective shearing edge of any knife section above the horizontal plane on which the straw reaper-combine is standing, expressed in mm. Where the height is adjustable, maximum and minimum values shall be measured.

3.13 Cutter Bar Lift — Arrangement for lifting of the cutter bar.

3.14 Cutter Bar Working Width — The distance, expressed in mm (*see* Fig. 2) between two vertical planes passing through the points of outermost dividers and parallel to the center of the cutter bar.

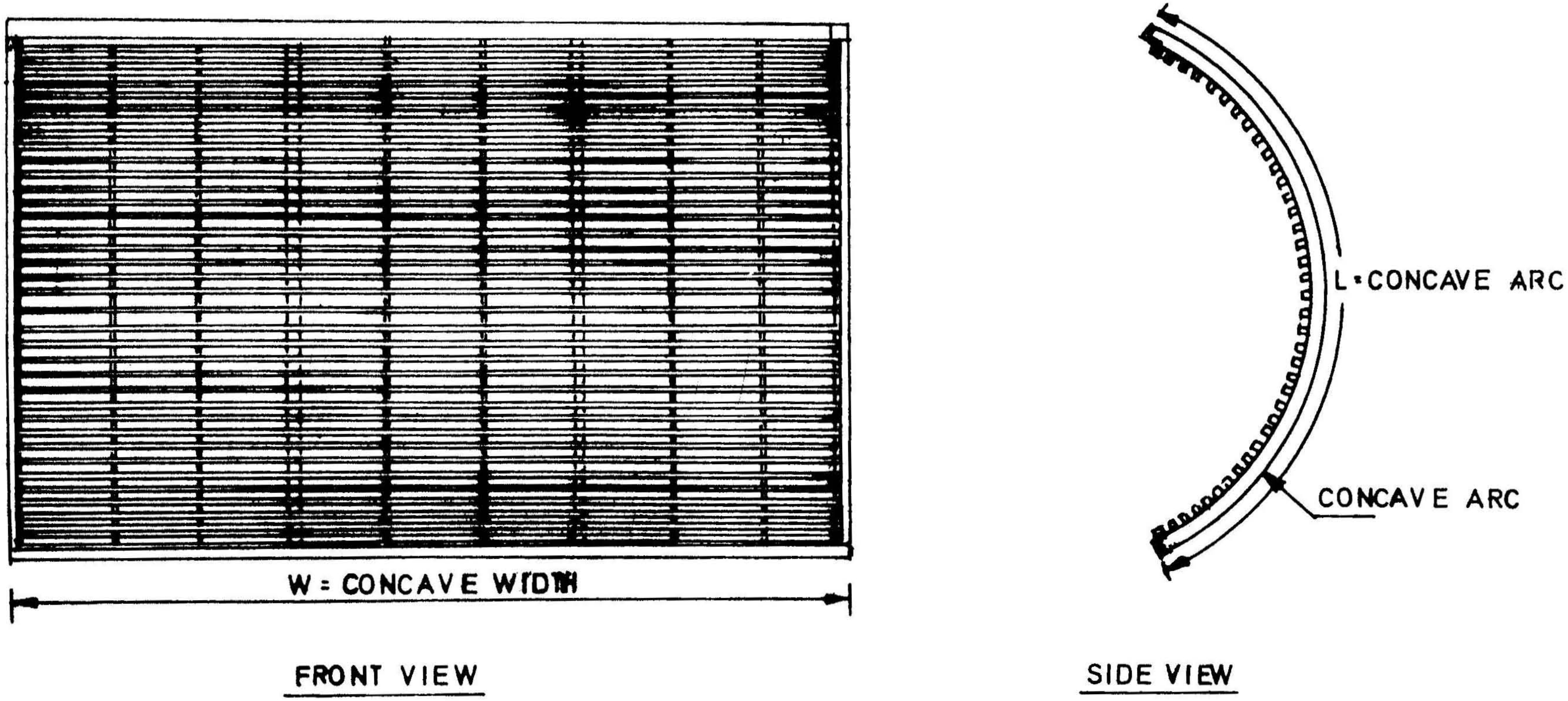
3.15 Cycle — Full movement of the knife from the one extreme in one direction and then its return to the starting point.

3.16 Cylinder or Concave Clearance — The gap between the tip of the cylinder to the inner surface of the concave, expressed in mm. The minimum and maximum clearance in a particular setting and adjustment range for both the front and the rear side of the concave shall be stated.

3.17 Cylinder or Drum — A balanced rotating assembly comprising of serrated knife blades on its periphery for chopping of straw.

3.18 Cylinder Diameter — The diameter of the circle generated by the outermost point of the chopping element of (*see* D in Fig. 3) cylinder, expressed in mm.

3.19 Cylinder Length or Width — The distance between the outermost point of the cylinder chopping elements (*see* L in Fig. 3), expressed in mm.



FRONT VIEW

SIDE VIEW

FIG. 1 CONCAVE OF STRAW REAPER-COMBINE

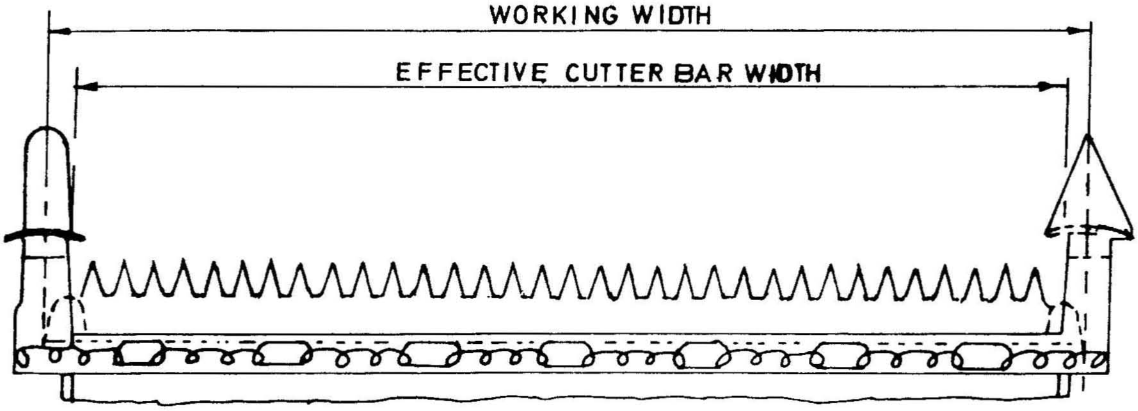


FIG. 2 CUTTER BAR

3.20 Feeder Beater — The beater provided in front of the chopping cylinder and rotating in the same direction to aid in feeding the straw to the cylinder.

3.21 Grain Pan — The pan for collecting the grains present in straw.

3.22 Ground Clearance — The height of the lowest point of the straw reaper-combine form a level supporting surface when the straw reaper-combine is fitted to its prime mover and tyres inflated to recommended pressure for field work expressed, in mm.

3.23 Header — The portion of straw reaper-combine comprising of the mechanism for gathering, cutting and stripping or picking the straw and delivering it to the cylinder.

3.24 Header Working Width — Distance between the center lines of the outermost divider points, expressed in mm.

3.25 Knife — Reciprocating part of the cutting mechanism comprising knife head, knife back and knife sections.

3.26 Knife Frequency — The number of the cycles the knife makes in a unit time. Frequency shall be expressed in whole cycles/min.

3.27 Knife Registration — The alignment of centre line of knife section with the centre line of guard.

3.28 Knife Stroke — The distance that a point of the knife travels from one extreme position to the other extreme position, expressed in mm.

3.29 Percent Open Area — It is the open area of the concave divided by the total area of the concave multiplied by 100.

3.30 Prime Mover Power — The power of prime mover, in kW at the rated PTO engine speed.

3.31 Reel — Revolving slats or arms with batons, arranged parallel to the cutter bar to guide the straw stubbles being cut by the knife to push it to cylinder. The reel may be of spring tine type.

3.32 Straw Reaper-Combine — A machine designed for harvesting, chopping and conveying the chopped straw from the stubbles (uncut or loose) left over during the harvesting operation of combine harvester in wheat field.

3.33 Straw Reaper-Combine Height — The vertical distance form the horizontal plane on which the straw reaper-combine is standing to the highest point on the straw reaper-combine, expressed in mm.

NOTES

1 Tyre and wheel or track shall be static and tyre shall be inflated to the field operating pressure recommended by the manufacturer.

2 The plane on which the straw reaper-combine is standing shall be substantially level.

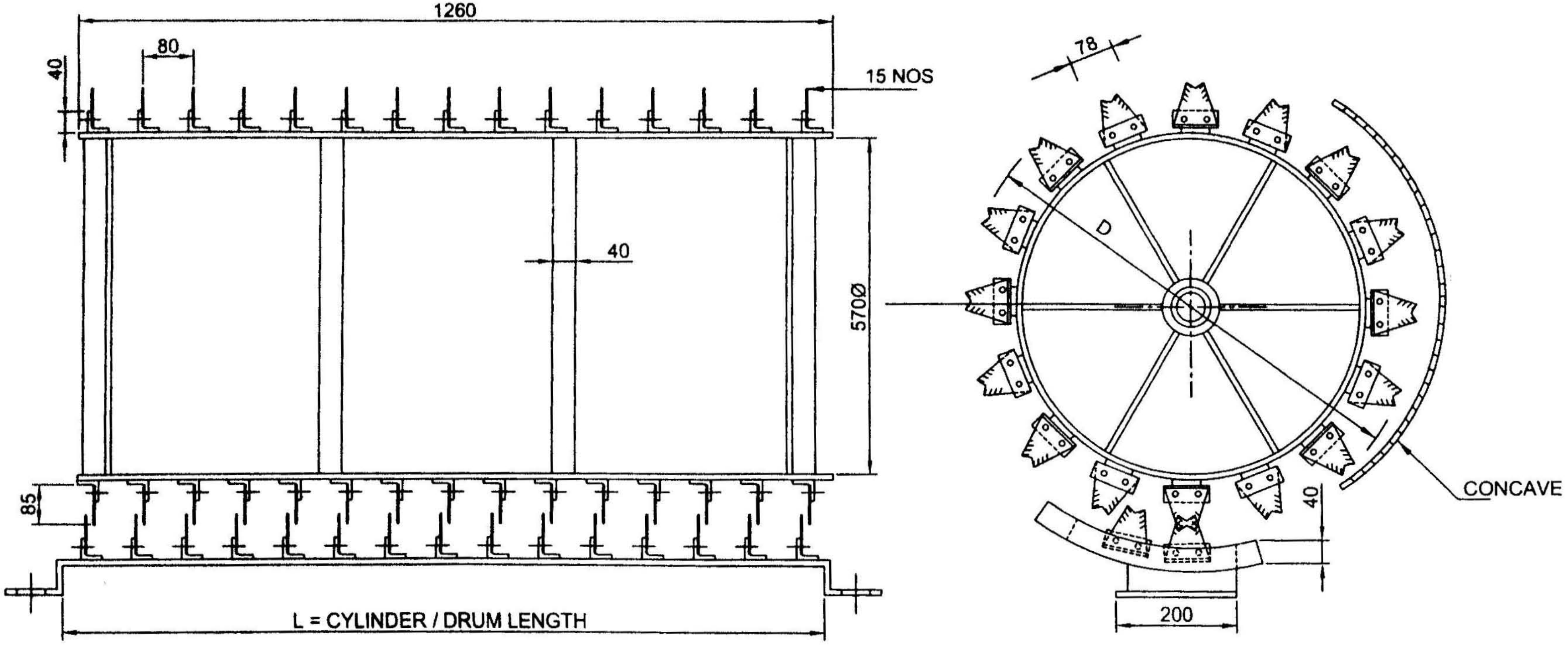
3 The height with all components in position for transport (excluding trolley) and field operation shall be specified.

3.34 Straw Reaper-Combine Length — The overall length from the foremost point of straw reaper-combine to the rearmost point of straw reaper-combine equipped for field operation measured parallel to the longitudinal center line of the straw reaper-combine, expressed in mm.

3.35 Straw Reaper-Combine Mass — The mass of complete straw reaper-combine equipped for field operation expressed in kilograms to the nearest 10 kg.

3.36 Straw Reaper-Combine Width — The overall width measured horizontally covering outermost extremities of straw reaper-combine, expressed in mm.

3.37 Straw Discharge Outlet — A device which carries the chopped straw to the storage unit.



FRONT VIEW

SIDE VIEW

Fig. 3 Bruising Drum with Counter Cutter Blades of Straw Reaper-Combine

3.38 Turning Radius — The distance from the turning center to the center of ground contact of the wheel describing the largest circle while the prime mover, straw reaper-combine and straw storage trailer combination is taking its shortest turn, expressed, in mm with standard trolley size. Proposed standard trolley size is 2.5 x 5 m (with and without brake).

3.39 Turning Space — The diameter of the circle, described by the outermost point of the straw reaper-combine when the prime mover, straw reaper-combine and straw storage trailer combination takes shortest turn, expressed in mm.

3.40 Wheel Track — The distance between the median planes of wheel on the same axle measured at the point of ground contact, expressed in mm.

4 STRAW REAPER-COMBINE OPERATION AND PERFORMANCE

4.1 Harvesting

The operation of cutting and collecting the straw in the field.

4.2 Feeding

The operation of conveying the cut straw into cylinder.

4.3 Chopping

The operation of cutting of straw in small pieces to make it suitable for animal feed.

4.4 Sieving

The operation of separating the grain, if any present in straw.

4.5 Dust in Straw

This is the amount of soil and fine trash (less than 3 mm) present in the chaff straw.

4.6 Grain Recovery

It is expressed as percentage of grain recovered by straw reaper from the field to the leftover grains after operation of grain combine in field.

4.7 Height of Stubbles

a) *Before Harvesting* — It is defined as height of wheat stubbles left overafter operation of grain combine in field, expressed in mm.

b) *After Harvesting* — It is defined as height of wheat stubbles in the field after operation of straw reaper-combine, expressed in mm.

4.8 Plant Population

It is expressed as number of plant stubbles/stalks in / m^2 area.

4.9 Rate of Work

It is defined as the area covered by straw reaper-combine per unit time and is expressed in terms of hectares per hour (ha/h).

4.10 Split Straw Percentage

It is defined as percentage of straw split after having passed through the machine.

4.11 Split Straw Length

It is defined as the length of split straw after bruising/ passing through the machine expressed in mm.

4.12 Straw Recovery (Percent)

It is expressed as percentage of straw recovered by the machine from the field while in operation.

4.13 Straw Mass Density

It is the mass of stubble/m^2 recovered manually (kg/ m^2) at a standard moisture content of 8 percent (db) and at a cut height of 35 mm.

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This Indian Standard has been developed from Doc : No. FAD 21 (1690).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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